Statistical relationship between elderly crime and the social welfare system in Japan: Preventative welfare approach for the deterrence of elderly crime

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Abstract

The purpose of this study is to verify the hypothesis that enhancing social welfare provisions, particularly livelihood subsidies, would have a preventative effect against elderly crime. This article statistically examines the relationship between the rate of crime committed by the elderly and the operation of the social welfare system, mainly in the form of livelihood subsidies. The elderly crime rate was defined as the number of arrests of those aged 65 or older per 100,000 inhabitants aged 65 or older in each prefecture. The types of crime used as dependent variables in this study were Penal Code offenses (total), felonious offenses, violent offenses, larceny offenses, and other Penal Code offenses. The index of the enhancement of social welfare system used as independent variables in this study were Public welfare expenses per inhabitant, the number of welfare offices per 100,000 inhabitants, the number of welfare officers per 100,000 inhabitants, and the sufficiency rate of caseworkers in each prefecture. Results from regression analyses show that public welfare expenses per inhabitant is significantly negatively correlated with Penal Code offenses (total), felonious offenses, other Penal Code offenses, and the sufficiency rate of caseworkers is significantly negatively correlated with Penal Code offenses (total), felonious offenses, and other Penal Code offenses. These results corroborate not only preceding statistical studies that show correlation but also the individual example investigation that shows direct causality between the social welfare and the crimes. Therefore, it is thought that these results were valid. The hypothesis of this study was supported from welfare expenses and caseworker's staffing points of view.

Introduction

Japan is the most aged country in the world, with an aged population (i.e., the proportion of those aged 65 years and above in the total population) of 23% in 2010. The average life expectancy is 79.5 years for men and 86.9 years for women, which are the highest rates in the world.

On the other hand, the number of crimes committed by the elderly in Japan is also increasing. For example, the number of arrests of those aged 65 years or older (excluding professional negligence resulting in death and injury) started to increase in 1991 and reached the

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highest point in 2007. The *White Paper on Crime*, published in 2009, calls for empirical studies into elderly crime, because "a social scientific work is essential in order to bring about a healthy aging society" [1].

There are many empirical studies on crime in the area of econometrics, with Backer's studies as some of the first in this area. His theory of crime applies economic rationality to criminal behavior, suggesting that human beings behave in such a way as to maximize personal benefits [2]. For example, people are more likely to commit a crime when the benefit gained from the crime is judged to be greater than the risk or cost of being arrested or punished. According to Backer's theory, improving the police's ability to arrest and imposing stricter punishment should assist in preventing crime because these will increase the probability of arrest and punishment, tilting the scale of benefit and risk.

The following highlights some studies on crime in Japan that draw on Backer's theory. Evans showed that in regard to the crime rate in Japan, there is a negative correlation between the proportion of those working in mining, communications, public utility, and construction industries. And a positive correlation between the Gini coefficient of employee households and the youth (over 10 and under 20 years of age) arrest rate [3]. Park performed a regression analysis of the rate of occurrence of crimes against social indices, and found that, in respect to theft and robbery, socio-economic variables such as the standard of living and gap in wages are influential, followed by preventative variables such as the rate of arrest and rate of conviction, as well as age composition [4-6]. Ohtake and Kohara [7] performed an analysis of time-series data from 1976 to 2008 and panel data by prefecture from 1975 to 2005 at five-year intervals. Their time-series data showed that an increase in the crime rate corresponds to an increased unemployment rate; likewise, crime rate decreases as the number of policemen per capita increases. However, this relationship varies from crime to crime. Their analysis of prefectural panel data showed that an increase in the poverty rate exerts more influence on an increase in the crime rate than an increase in the unemployment rate. Based on the analysis of both data sets, Ohtake and Kohara posit that the crime rate is consistently correlated with labor market conditions, which are closely related to the costs or benefits of crime and crime prevention capabilities such as the police.

These studies focused on labor market conditions and crime; for example, unemployment rate as an indicator of social circumstances of joblessness, in which the cost of being arrested is decreased. Each study also adopted the conviction rate, arrest rate, and number of police as preventative variables.

Methods to prevent crime, such as strengthening police ability to arrest and introduce stricter punishments, are aimed at isolating criminals from the general population, most often in jails. In the case of elderly crime in Japan, authorities find it more and more difficult to deal with the increase of elderly inmates as well as the high re-offending rate [8]. For these reasons, in 2011, the Japanese government launched a project to provide welfare and community support for elderly people who have been released from jail. Likewise, in the field of legal welfare (the studies and practice for supporting delinquent persons) in Japan, support for inmates who have completed their term is a major theme of research [9-10].

The research approach adopted by previous studies seeking ways to prevent elderly crime is not conducive to proposing effective solutions for the social problem of elderly criminality. Social problems such as crime, illness, and poverty usually produce reactive solutions (i.e., after the problems occur), but the best policy is actually prevention. This is the idea of preventative

welfare that Katahira proposes [11-12]. While current welfare support, such as the project to support community life, is important, the best course of action is to prevent elderly crime by examining everyday living conditions of elderly people and by providing preventative measures.

The Ministry of Justice in Japan has identified a contributing factor to the increase in elderly crime: The proportion of those without stable income and those with low income is increasing, as is the proportion of those with no income or welfare support such as livelihood subsidies. Against this background, elderly criminals experience issues such as economic anxiety, which is a major factor in the increase of elderly crime [1].

If the aggravating factor of economic anxiety could be removed, elderly crime could be prevented. The current safety net for economic anxiety is social welfare provisions centered on livelihood subsidies. Accordingly, the expansion of this system would have a preventative effect against elderly crime. This hypothesis differs from simply strengthening police capability or introducing stricter punishments as methods of preventing crime; rather, this study aims to examine the preventative effect of social welfare provisions on elderly crime by drawing on theories of preventative welfare.

There are very few empirical analyses based on this framework, and in Japan, there is only one study by Enoki et al. that has pointed out the statistically negative correlation between crime motivated by poverty and the size of welfare spending per inhabitant [13]. However, like other preceding studies, Enoki et al.'s study does not exclusively focus on elderly crime, so there is a need to identify if there is a similar correlation in elderly crime specifically. This study also shows the degree of sufficiency of social welfare provisions in terms of the budget, though the relationship between the budget and the way social welfare provisions are run, including the size of staff, has not been examined.

The current study, therefore, statistically examines the relationship between elderly crime and the operation of the social welfare system, centering on livelihood subsidies.

Method

Public welfare expenses per inhabitant that represents the size of welfare spending per inhabitant in study by Enoki et al. refers to the relationship revealed by cross-sectional research on data from specific years [13]. This study first adopted the cross-sectional research method to carry out a regression analysis on data from specific years in order to test whether the index would reveal any correlation with elderly crime. The year analyzed in this study was 2010, as this was the latest statistical year that was not affected by the Great East Japan Earthquake in 2011.

1. Dependent variables

The elderly crime rate, the subject of the analysis of this study, was defined as the number of those arrested who were 65 years old or older per 100,000 inhabitants aged 65 or older by prefecture. In terms of crime type, Penal Code offenses (total, excluding traffic offenses) were adopted as a dependent variable in order to investigate the correlation with elderly crime as a whole. Felonious offenses, violent offenses, larceny offenses, and other Penal Code offenses including intrusion upon habitation or Stealing of lost property, which are considered to be closely related to poverty, were adopted as additional dependent variables in order to investigate the differences crime types.

2. Independent variables

The agency responsible for livelihood subsidies provisions in Japan is the social welfare office. Article 14 of the Social Welfare Act of 2000 mandates that prefectures and cities (including special districts) set up a social welfare office;

therefore, it is considered an official agency. Smaller local authorities such as towns and villages can set up social welfare offices voluntarily. This discrepancy in the size of the population for which a social welfare office is responsible can affect the accessibility for clients to social welfare offices, such as between areas with few social welfare offices and those with a greater number of offices.

In addition to livelihood subsidies, the social welfare office is the front-line social welfare provision agency that administers support, nurturing, and correction in regard to children's welfare as well as welfare for mothers and children, widows, elderly, and the physically and mentally disabled. According to the law, each social welfare office must have a director as well as supervisors, caseworkers, and secretaries (Social Welfare Act [15]).

Caseworkers, under the supervision of the director, carry out a variety of administrative duties. These duties include interviewing those who are in need of some measures of support, nurturing, or correction, investigating their assets and social circumstances, determining whether or not they need some measures of protection or others—and if that is the case, determining the type of measures necessary—and providing them with life guidance (Social Welfare Act [15] Section 4). In other words, caseworkers in Japan are authorized to carry out personal investigations and make decisions regarding cash benefits received, as well as to provide support for the clients of social welfare system to live independently.

Article 16 of the Social Welfare Act stipulates that a social welfare office run by the city should post one caseworker per 80 households in receipt of livelihood subsidies for a social welfare office run by a city, and that a social welfare office run by the prefecture should have one caseworker per 65 households subsidies for an office. The sufficiency rate of caseworkers refers to the proportion of the actual number of caseworkers in relation to the standard figure. The higher the number of welfare officers per 100,000 inhabitants and/or the sufficiency rate of the caseworkers, the better staffed the social welfare office is.

The following independent variables are used in this study to measure the degree of sufficiency of social welfare provision. Public welfare expenses per inhabitant is used as an index of sufficiency of the welfare budget by prefecture, as identified in preceding studies; the number of welfare offices per 100,000 inhabitants as an index of accessibility to the social welfare office; the number of welfare officers per 100,000 inhabitants as an index of sufficiency of staffing levels; and the sufficiency rate of caseworkers.

Table 1 shows the definition of these variables and sources of data and Table 2 provides descriptive statistics.

3. Analyses

A simple correlation analysis was done prior to the regression analysis. Furthermore, in order to prevent multicollinearity, the correlation coefficient between each independent variable was worked out and when there was more than a 0.7 correlation, one of the independent variables was removed from the analysis. As a result, in respect to correlation among independent variables, the public welfare expenses per inhabitant, the number of welfare offices per 100,000 inhabitants, and the number of welfare officers per 100,000 inhabitants showed a correlation of 0.7 and above (Table 3). As such, in accordance with the aim of the study, public welfare expenses per inhabitant and the sufficiency rate of caseworkers were used as independent variables for the regression analysis. In order to see each variable's influence, the forced entry method was used in the regression analysis. PASW Statistics 18 was used for computations and analyses.

Table 1. Definition of variables and sources of data

	Variables	Definition
Dependent Variable	Crime rate of elderly people Penal Code offenses (total), Felonious offenses, Violent offenses, Larceny offenses, Other Penal Code offenses	The arrest staff of each prefecture (65 years or older)[a] ÷Basic Resident Register population of each prefecture (65 years or older)[b] ×100,000
Independent Variable	Public welfare expenses per inhabitant	Public welfare costs of prefectures[c] ÷Basic Resident Register population of each prefecture[b] × 100,000
	The number of welfare offices per 100,000 inhabitants	The number of welfare offices of each prefecture[d] ÷Basic Resident Register population of each prefecture[b] × 100,000
	The number of welfare officers per 100,000 inhabitants	The number of welfare officeres of each prefecture[e] ÷Basic Resident Register population of each prefecture[b] × 100,000
	The sufficiency rate of caseworkers	The proportion of the actual number of caseworkers in relation to the standard figure[d]

Notes : [a] Criminal statistic in 2010. National Police Agency-Japan- ; 2011. Available from : https://www.npa.go.jp/archive/toukei/keiki/h22/h22hanzaitoukei.htm (accessed June 18, 2014) (in Japanese)
[b] Population based on the Basic Resident Register and the number of households. The Ministry of Internal Affairs and Communications ; 2011. Available from : http://www.soumu.go.jp/menu_news/s-news/01gyosei02_01000001.html (accessed June 18, 2014) (in Japanese)
[c] Prefectures' settlement of accounts situation investigation. The Ministry of Internal Affairs and Communications ; 2011. Available from : http://www.soumu.go.jp/iken/zaisei/h22_todohuken.html (accessed June 18, 2014) (in Japanese)
[d] Welfare office present situation investigation. The Ministry of Health, Labour and Welfare ; 2011. Available from : http://www.mhlw.go.jp/toukei/list/75-16.html (accessed June 18, 2014) (in Japanese)

Table 2. Descriptive statistics

Variables	n	Minimum	Maximum	Mean	SD
Dependent Variable (Crime rate of elderly people)					
Y1: Penal Code offenses (total)	47	104.2	220.5	156.7	31.4
Y2: Felonious offenses	47	2.1	797.1	88.0	173.6
Y3: Violent offenses	47	1.9	23.6	11.6	5.1
Y4: Larceny offenses	47	69.8	180.5	120.2	23.1
Y5: Other Penal Code offenses	47	3.1	54.8	18.8	14.4
Independent Variable					
X1: Public welfare expenses per inhabitant	47	0.0	0.1	0.1	0.0
X2: The number of welfare offices per 100,000 inhabitants	47	0.2	2.9	1.1	0.5
X3: The number of welfare officers per 100,000 inhabitants	47	27.0	135.0	59.7	22.1
X4: The sufficiency rate of caseworkers	47	73.2	170.6	111.2	21.2

Table 3. Zero order correlation of independent variables

Independent Variables	X1	X2	X3	X4
X1	-	71[a]	75[a]	10
X2	71[a]	-	75[a]	29[b]
X3	75[a]	75[a]	-	15
X4	10	29[b]	15	-

Notes: [a]p<0.01; [b]P<0.05

X1: Public welfare expenses per inhabitant
X2: The number of welfare offices per 100,000 inhabitants
X3: The number of welfare officers per 100,000 inhabitants
X4: The sufficiency rate of caseworkers

Results

The simple correlation analysis showed that there was a statistically significant negative correlation between public welfare expenses per inhabitant, the number of welfare offices per 100,000 inhabitants, the number of welfare officers per 100,000 inhabitants and Penal Code offenses (total), felonious offenses, violent offenses and other Penal Code offenses. In addition, the sufficiency rate of caseworkers showed a statistically significant negative correlation with Penal Code offenses (total), felonious offenses, and other Penal Code offenses (Table 4).

The regression analysis showed that there was a statistically significant negative correlation between public welfare expenses per inhabitant and Penal Code offenses (total) (β = -0.317), felonious offenses (β = -0.368), other Penal Code offenses (β = -0.511), and between the sufficiency rate of caseworkers and Penal Code offenses (total) (β = -0.337), felonious offenses (β = -0.368) and other Penal Code offenses (β = -0.422) (Table 5). Even in the simple correlation analysis, a statistically significant correlation was shown among these variables and none were reversed. In each analysis, the ANOVA (analysis of variance table) result was statistically significant. In addition, no variable exceeded 10 in terms of VIF (Variance Inflation Factor) to suggest multicollinearity.

Discussion

The hypothesis of this study is that enhancing social welfare provisions, particularly livelihood subsidies, would have a preventative effect against elderly crime. For the inspection of this hypothesis we focus on both variables of public welfare expenses per inhabitant and the sufficiency rate of caseworkers which showed satistically significant negative correlation with elderly crime in this study and perform the reasoning about larceny offenses that was expected to show statistically significant negative correlation with elderly crime.

1. Public welfare expenses per inhabitant

This study found that welfare spending per inhabitant has a negative correlation with Penal Code offenses (total) and felonious offenses,

Table 4. Zero order correlation of all variables

Variables	Y1	Y2	Y3	Y4	Y5	X1	X2	X3	X4
Y1	-								
Y2	37[b]	-							
Y3	58[b]	24	-						
Y4	83[b]	-04	29[a]	-					
Y5	58[b]	78[b]	42[b]	06	-				
X1	-35[a]	-40[b]	-29[a]	-07	-55[b]	-			
X2	-46[b]	-52[b]	-55[b]	-11	-59[b]	71[b]	-		
X3	-29[a]	-44[b]	-40[b]	07	-61[b]	75[b]	75[b]	-	
X4	-37[a]	-41[b]	-13	-13	-47[b]	10	29[a]	15	-

Notes: [a]p<0.01; [b]P<0.05
Y1: Penal Code offenses (total)
Y2: Felonious offenses
Y3: Violent offenses
Y4: Larceny offenses
Y5: Other Penal Code offenses
X1 :Public welfare expenses per inhabitant
X2: The number of welfare offices per 100,000 inhabitants
X3: The number of welfare officers per 100,000 inhabitants
X4: The sufficiency rate of caseworkers

Table 5. The results of multiple linear regression analysis

Variables	Y1: Penal Code offenses (total)		Y2: Felonious offenses		Y5: Other Penal Code offenses	
	β	95% CI	β	95% CI	β	95% CI
X1: Public welfare expenses per inhabitant	-0.317[a]	-1611.926 , -138.617	-0.368[b]	-9493.597 , -1721.018	-0.511[b]	-923.294 , -368.408
X4: The sufficiency rate of caseworkers	-0.337[a]	-0.896 , -0.104	-0.376[b]	-5.171 , -0.992	-0.422[b]	-0.436 , -0.137
R	0.48		0.55		0.69	

Notes: CI = confidence interval
[a]P<0.01; [b]P<0.05.

which is consistent with the findings of preceding studies by Enoki et al. and Park that use similar variables.

The index of public welfare expenses per inhabitant in the study by Enoki et al showed a statistically negative correlation with the type of crime motivated by poverty (i.e., felonious offenses, larceny offenses, other Penal Code offenses) in the cross-sectional study of the statistical year of 2005 [13]. Park's study, in which a time-series regression analysis of the crime rate in Japan was conducted in the area of

econometrics, uses a variable called "social wage." This is defined as "the proportion of social security spending in relation to national income." Park assumes that an increase in social welfare spending correlates to a more equal distribution of income, and the variable's direct effect on crime rate would be negative. Park's regression analysis showed that there is a statistically negative correlation between this variable and rape, murder, and violence [4-6]. Our result mentioned above corroborates previous studies using similar variables.

A statistical correlation does not indicate direct causality. So the correlation was considered with empirical studies. The empirical study on a Ministry of Justice survey of elderly criminals and inmates reported that 37.8% of respondents described their situation before being jailed as "I wanted to work but could not find any" or "I could not work because of illnesses." Similarly, 55.9% said they had "difficulties in everyday life" in terms of finance. They were also listed as factors for committing the crime (s) that led to their incarceration as "it was difficult to make ends meet" (24.6%) and "I did not have any work" (23.0%). When focusing on the perception of elderly inmates who committed murder, which was categorized as a felonious offense that showed a negative correlation with welfare spending per inhabitant, the response "it was difficult to make ends meet" occupied 23% [14]. The circumstances these elderly criminals identify as difficult and as factors for committing crime can be tackled by social welfare provisions that focus on livelihood subsidies. With the empirical study on Ministry of Justice survey of elderly criminals and inmates suggests that the correlation found in the study is considered valid.

2. The sufficiency rate of caseworkers

Next, the sufficiency rate of caseworkers was considered. The sufficiency rate of caseworkers is based on the actual number of caseworkers who handle households in receipt of livelihood. The regression analysis in this study showed that in an area with a high sufficiency rate of caseworkers, the number of crimes committed by the elderly is small. Conversely, in an area with a low sufficiency of caseworkers the crime rate committed by the elderly would be high.

Morikawa et al.'s [15] survey suggested that a low sufficiency rate is linked to the feelings of burden by a caseworkers, too much work, and insufficiency in providing assistance for increased independence. Morikawa et al. carried out a survey in 2003 with caseworkers from all social welfare offices in Japan regarding "the feelings of burden towards the work in general" and "self-evaluation of assistance for increased independence." A cross-tabulation of the number of cases a caseworker was responsible for (i.e., the number of households to look after) and the feelings of burden of work—from four choices: "very burdensome," "rather burdensome," "not that much," and "not a burden at all"—showed that the proportion of the total of "not that much" and "not a burden at all" was 19.2% if the number of cases was 50 or below, but 10% if the number was more than 51. The proportion of "very burdensome" was 24.7% when the number of cases was 50 or below, and 46.1% when the number of cases was 91 or more. When the respondents who said "very burdensome," "rather burdensome," and "not that much" were asked to choose two reasons from the following seven options—"the case is complex," "too much work," "no time," "lack of expertise," "the work is not suitable for me," "inappropriate supervision," and "other"—the most frequent answer was "the case is very complex," regardless of the degree of feelings of burden. In contrast, the response "too much work" was chosen more frequently as the feelings of burden increased. This suggests a perceived relationship among the number of cases, the feelings of burden among the caseworker, and too much

work. In the case of self-evaluation with regard to the caseworker's assistance with increased independence, the major reason for thinking "insufficient" was not enough commitment due to too many cases to handle. Understaffing of social welfare offices has been seen as a problem to be solved in the Diet (Japanese government) as well [16]. More assistance for increased independence is sought to allay the burden felt by the increase in the number of households in receipt of livelihood subsidies, as well as the government's financial problems [17]. This suggests the importance of appropriate staffing in order to run a sufficient social welfare system.

On the other hand, the empirical study on a Ministry of Justice survey of elderly criminals and inmates has identified needs of elderly criminals who face a number of welfare problems. For example, 35.2% of respondents to a Ministry of Justice survey said that they did not have anyone to talk to about their difficulties and worries [14]. It is possible likely that if caseworkers in an area with a high sufficiency rate of caseworkers in charge of livelihood subsidies could talk more to the elderly person who has difficulties and worries, the crime could be prevented through a combination of living guidance and livelihood subsidies as a result.

The statistical correlation in this study can be considered consistent, given that the feelings of burden and assistance for increased independence vary according to the number of households for which caseworkers are responsible, and that elderly criminals did not have caseworkers to talk to despite having difficulties in life.

3. Larceny offenses and Embezzlement of lost articles in other Penal Code offenses

It was thought that larceny offenses was correlated with elderly crime which is related to the economical poverty as a matter of course. But it did not show statistically significant negative correlation with public welfare expenses per inhabitant and the sufficiency rate of caseworkers. The reason of this result is considered as follows:

Other Penal Code offenses which is the other crime type in this study was correlated with public welfare expenses per inhabitant and the sufficiency rate of caseworkers. This crime type includes Embezzlement of lost articles (83.9%). This crime is common with larceny offenses at a point to steal the property of others. Nevertheless, this crime is distinguished from larceny offenses and classified to other Penal Code offenses in the definition of the criminal law in Japan. As a result the number of larceny offenses are decreased. Thus, it is assumed that the result in this study shows no statistically significant correlation. We have to continue investigating this problem in future.

Conclusions

The index of public welfare expenses per inhabitant can serve as a variable that is expected to prevent an elderly crime. And the result in this study shows the negative correlation between the sufficiency rate of caseworkers and crime, which has not been clarified in previous studies, both statistically and in terms of a literature review. Therefore, it is suggested that the study's hypothesis that enhancing social welfare provisions, particularly livelihood subsidies, would have a preventative effect against elderly crime is partly supported from welfare expenses and caseworker's staffing points of view.

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